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### Clearing the air: an accessible system for suction and safe evacuation of pneumoperitoneum during laparoscopy in patients with COVID-19

Editor

Amidst the current global COVID-19 pandemic, the Intercollegiate guidelines<sup>1</sup> recommend open surgery over laparoscopy, while others recommend smoke evacuators and virus filters to reduce risk of transmission during laparoscopy<sup>2,3</sup>. Laparoscopy is considered an aerosol-generating procedure and exposure may occur during suction or release of carbon dioxide (CO<sub>2</sub>). Although there is a theoretical risk of transmission of SARS-CoV-2 via aerosols, this has not been proven<sup>1-4</sup>. Laparoscopy may reduce intraoperative exposure to smoke compared with open surgery if proper equipment for several

smoke evacuators with compatible virus filters are available commercially but they represent an additional cost that may be prohibitive. The challenges posed by the COVID-19 pandemic have made it necessary for surgeons to be innovative. Here, we describe a simple set-up for pneumoperitoneum evacuation and recommend retrofitting heat moisture exchanger (HME) filters if compatible virus filters are unavailable.

Our proposed system consists of an intravenous drip set, suction valve, plastic suction tubing and surgical suction system with an HME as a virus filter (Fig. 1a). HME filters have high virus filtration rates exceeding 99.999 per cent<sup>5</sup>. We have retrofitted HME filters with 3D-printed adapters onto an existing mobile surgical suction system with good effect (Fig. 1b). We suggest a high flow setting on the laparoscopic insufflator, low suction pressure setting on the surgical suction system, and only partially opening the trocar side port to which it is connected. This active system allows for finetuning of the smoke clearance by adjusting the suction settings.

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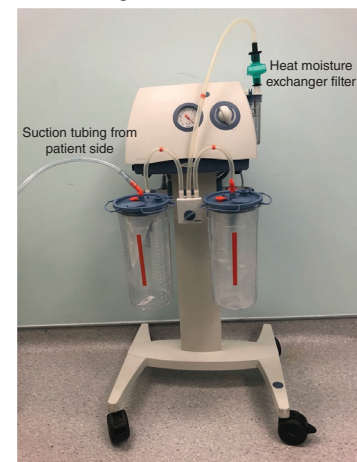
- 1 Intercollegiate Group. *Intercollegiate General Surgery Guidance on COVID-19 Update*; 27 March 2020. <https://www.rcsed.ac.uk/news-public-affairs/news/2020/march/intercollegiate-general-surgery-guidance-on-covid-19-update> [accessed 1 April 2020].
- 2 Spinelli A, Pellino G. COVID-19 pandemic: perspectives on an unfolding crisis. *Br J Surg* 2020; <https://doi.org/10.1002/bjs.11627> [Epub ahead of print].
- 3 Mowbray NG, Ansell J, Horwood J, Cornish J, Rizkallah P *et al*. Safe management of surgical smoke in the age of COVID-19. *Br J Surg* 2020; <https://doi.org/10.1002/bjs.11679> [Epub ahead of print].
- 4 COVIDSurg Collaborative. Global guidance for surgical care during the COVID-19 pandemic. *Br J Surg* 2020; <https://doi.org/10.1002/bjs.11646> [Epub ahead of print].
- 5 Heuer JF, Crozier TA, Howard G, Quintel M. Can breathing circuit filters help prevent the spread of influenza A (H1N1) virus from intubated patients? *GMS Hyg Infect Control* 2013; 8: Doc09.

Fig. 1 System for suction and safe evacuation of pneumoperitoneum

a Assembled smoke evacuation unit



b 3D printer-adapted heat moisture exchange filter



a Assembled smoke evacuation unit. b 3D printer-adapted heat moisture exchange filter fitted into suction unit.